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Annual Report on Vital Signs Monitoring of Wolf (Canis lupus) Distribution and Abundance in Yukon-Charley Rivers National Preserve, Central Alaska Network

2011 Report

Natural Resource Technical Report NPS/CAKN/NRTR—2011/485

ON THE COVER

John Burch radiocollars 3 wolves from the Tatonduk River Pack on the Yukon River, March 2011.

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Executive Summary

- Wolf populations have been monitored in Yukon-Charley Rivers National Preserve (YUCH) from March 1993 to present. Beginning October 2005 the project was incorporated into Central Alaska Network (CAKN) Vital signs monitoring program as a cost shared venture.
- Wolves throughout the greater Yukon-Charley Rivers area are targeted for monitoring of abundance and distribution. This past winter, wolf captures were conducted in November 2010 and March 2011. Monitoring radiocollared packs via radio telemetry flights will occur throughout the year with a concentrated period of flights in March – April and again in September – October. All field work is conducted using 1 or 2 biologists and 1 - 3 pilots.
- In winter 2010-2011, fifteen more wolves in 10 packs were captured and collared. Two packs, Woodchopper and Tatonduk packs, were found by snowtracking. At least 1 area (the lower Kandik River) is known to be occupied by wolves, but remains without collared wolves. Hopefully wolves from this pack can be found and captured in winter 11-12.
- A new measure was developed last year to help make wolf management decisions quickly: the drop in counts of wolves from fall (September/October) to Spring (March and April). This year the counts dropped from 74 to 58 wolves, a decline of 22% which is in the middle of normal range of 15 previous years of data not thought to be influenced by predator control.
- The Fall 2010 wolf density (5.09 wolves/1000 km^2) was above the 18 year average of 4.23, this was followed by a spring 2011 density of 3.92 wolves/1000 km^2 which is one of the highest spring densities measured in the study, equaled only in Spring 2004, well above the 18 year average of 2.81. This was likely due to large numbers of Fortymile caribou wintering in the Charley River.
- Fall 2010 mean pack size was 7.4 wolves/ pack, above an 18 year average of 7.14.
- Fall 2010 average litter size was 3.1 pups/ pack, below an 18 year average of 3.6
- No wolves are known to have been shot or trapped within YUCH for winter 2010-11, however sealing records for the past winter are not yet available from ADF&G.
- No substantial changes in protocol are anticipated for the upcoming field season for biological year 11-12 (May 1, 2011 – April 30, 2012).

Key Words

Yukon-Charley Rivers National Preserve, wolves, *Canis lupus*, radiotelemetry, population dynamics, density estimation.

Acknowledgments

This study was funded by U.S. National Park Service Central Alaska Network (CAKN) and Yukon-Charley Rivers National Preserve, Alaska. The skilled and safe aircraft support provided during the study by S. Hamilton, D. Miller, R. Swisher, and T. Cambier is always much appreciated. None of the work gets done without the pilots, they are there for every observation and capture, and are often the unsung heroes of most wildlife survey work throughout Alaska. Both preserve and network staff reviewed the report and made several helpful comments.

Introduction

The Central Alaska Network (CAKN) has adopted a holistic view of network ecosystems and will track the major physical drivers of ecosystem change and responses of the two major components of the biota, plants and animals. Thus, CAKN has identified Fauna Distribution and Abundance as one of its top three vital signs. In general, CAKN wants to know where fauna are distributed across the landscape and to track changes in both their distribution and abundance. The Fauna Distribution and Abundance vital sign includes monitoring efforts for a suite of vertebrate species spanning the significant elevation gradient found in CAKN parks, and also including species of specific interest within each park. Wolves (*Canis lupus*), occur in all three network parks and are one of six keystone large mammal species in interior Alaska. Wolves are of great importance to people from both consumptive and non-consumptive viewpoints, and to the ecosystem as a whole. From a monitoring standpoint, wolves are considered to be good indicators of long-term habitat change within park ecosystems because they depend on healthy populations of large ungulate prey, which in turn respond to vegetation, weather and other habitat patterns across the entire landscape (Mech and Peterson 2003, Fuller et al. 2003). As a top predator, wolves can play a key role in influencing ungulate populations, and as a result may influence vegetation patterns (Miller et al. 2001, Ripple and Beschta 2003). The effects of wolves on ungulate populations may be important determinants of ungulate availability for subsistence harvest on NPS Park and Preserve lands in Alaska, and harvest by the general public on NPS Preserve lands (National Park Service 2001). NPS began this study in 1993 and has supported it annually ever since. With the incorporation into the CAKN network vital signs monitoring program in 2005, the scope of the project was expanded.

Wolves are a species specifically identified in the enabling legislation and management objectives of all three CAKN parks (U. S. Congress 1980). Wolves are important to park visitors because of the unique opportunities to view or hear wolves in Alaskan parks. While the primary objectives of wolf monitoring will be to track the distribution and abundance of wolves, a variety of accessory data will be obtained in the monitoring process that are likely to be valuable for wildlife management and research. The body of data on wolf populations in Alaska parks is of great value in developing scientific models of predator/prey systems. In heavily visited portions of the parks, managers may want to know the locations of active wolf dens and rendezvous sites so that they can be protected from disturbance. When intensive wolf harvest or wolf control take place near parks, it is important to know home range boundaries and travel patterns of wolf packs utilizing park lands. These data are used to determine and possibly mitigate impacts of wolf control activities outside the parks. Data on the genetic and morphological characteristics of wolves, obtained as a sidelight to wolf capture, are important in evaluating long-term changes in wolf populations in Alaska.

This report focuses on monitoring the wolf population that utilize Yukon-Charley Rivers National Preserve (YUCH) (Figure 1).

Measurable Objectives

- Locate non-radiocollared wolf packs utilizing Preserve lands by snow tracking.
- Capture and radio-collar 1 -3 individuals in each wolf pack identified in the study area.
- Determine the demography (numbers, colors, age structure) of wolf packs using Preserve lands.
- Obtain morphological measurements from captured wolves.
- Obtain genotypic data (mitochondrial and microsatellite DNA) from captured wolves, conducted by Yuch Biologist Melanie Flamme, and USGS geneticist Sandy Talbot.
- Obtain immunological (disease exposure) data from captured wolves.
- Define home ranges of collared wolf packs via GPS collar data and aerial telemetry.
- Determine pack size for each collared pack in fall (early winter) and spring (late winter) each biological year (May 1 – April 30).
- Define the mosaic of wolf home ranges (population area) for estimating biannual wolf densities (fall and spring of each biological year).
- Count the total number of wolves in each radio-marked pack in fall (Sept- Oct) and spring (March – April) to calculate the percentage of the annual drop in mean pack size over winter.
- Perform annual capture efforts to maintain coverage of radio collars in the population.
- Detect pack extinction and pack formation events in the population.
- Detect changes in wolf density over time
- Detect changes in wolf pack size over time
- Detect changes in wolf home range size over time.
- Detect changes in the morphological, immunological, and genetic makeup of the wolf population over time.

Study Area

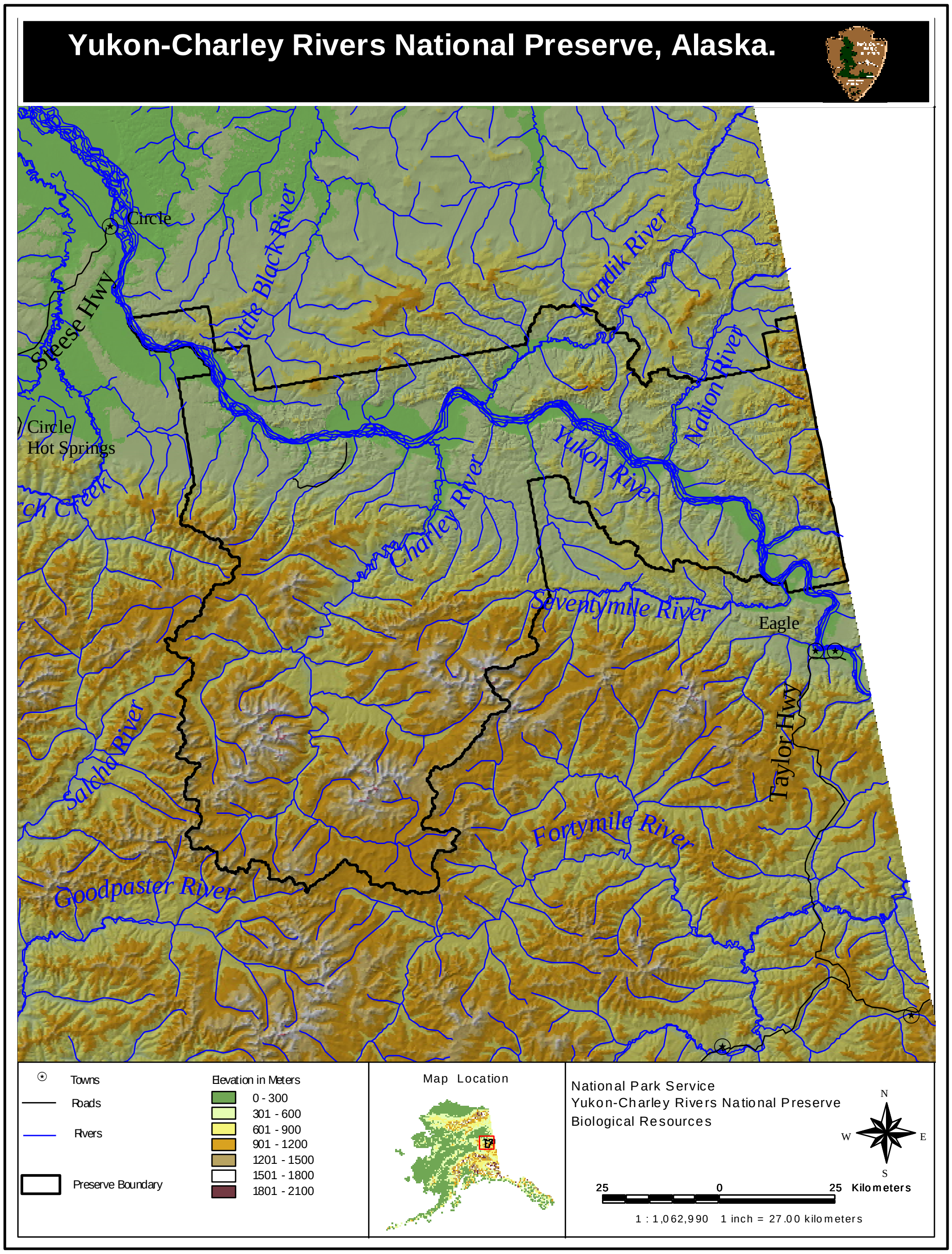

Figure 1. Wolf monitoring study area, Yukon-Charley Rivers National Preserve.

Methods

Methods followed the CAKN wolf monitoring protocol (Meier et. al. 2009) and include aerial radio telemetry, the use of GPS collars, and direct observation as primary techniques. Radiotelemetry and GPS provide the most effective way to identify and monitor individual packs and populations of wolves as well as monitoring natality, recruitment, causes and rates of mortality and dispersal, and predator – prey relationships (Mech et. al. 1998, Mech and Barber 2002).

Results and Discussion

Captures and Radio Telemetry

During November 2010 and March 2011, 15 wolves were captured and radio-collared in or near YUCH, 6 of which were recaptures. Sex and age composition of captured wolves included 6 adult males, 8 adult females, and 1 yearling female. The capture sample is biased toward adult wolves as breeding adult wolves are specifically targeted because they are less likely to disperse. Colors of captured wolves varied widely from black to ‘blue’ (silver gray) to various shades of gray to white. Over the history of the project weights of captured males ranged from 70-148 lbs., (32-67 kg) averaging 108 lbs (49 kg), captured females ranged from 57-130 lbs. (26–59 kg) and averaged 90 lbs (41 kg). There have been 216 wolf captures during the 18 year history of the project, 140 (65%) of them inside the Preserve boundary and 76 (35%) out (Figure 2).

We had good snow conditions for searching for uncollared packs in 3 areas in November 2010. The Woodchopper Creek and Yukon Fork packs were found and collared in the area of the old Webber Creek Pack that was killed in the ADF&G wolf control in March 2010. In the remaining area of the Lower Kandik drainage, tracks were seen of 5 or 6 wolves, but we could not find them to capture any. Reports of this pack on the Kandik River from Local trapper Mark Richards help confirm these wolves as a resident pack that we hope to find and capture in winter 2011 - 2012.

Genetics

Blood and /or tissue samples (cheek swabs and hair roots) are collected from all captured wolves for genetic analysis from both YUCH and Denali National Park and Preserve (Denali). Unique samples have been collected from over 150 individual wolves from both parks. Microsatellite data taken from the DNA extracted from these samples will be analyzed to assess the baseline levels of genetic variation in each wolf population and to determine the consistency of pack lineages. This work is conducted by Yuch Biologist Melanie Flamme, in cooperation with USGS geneticist Sandy Talbot.

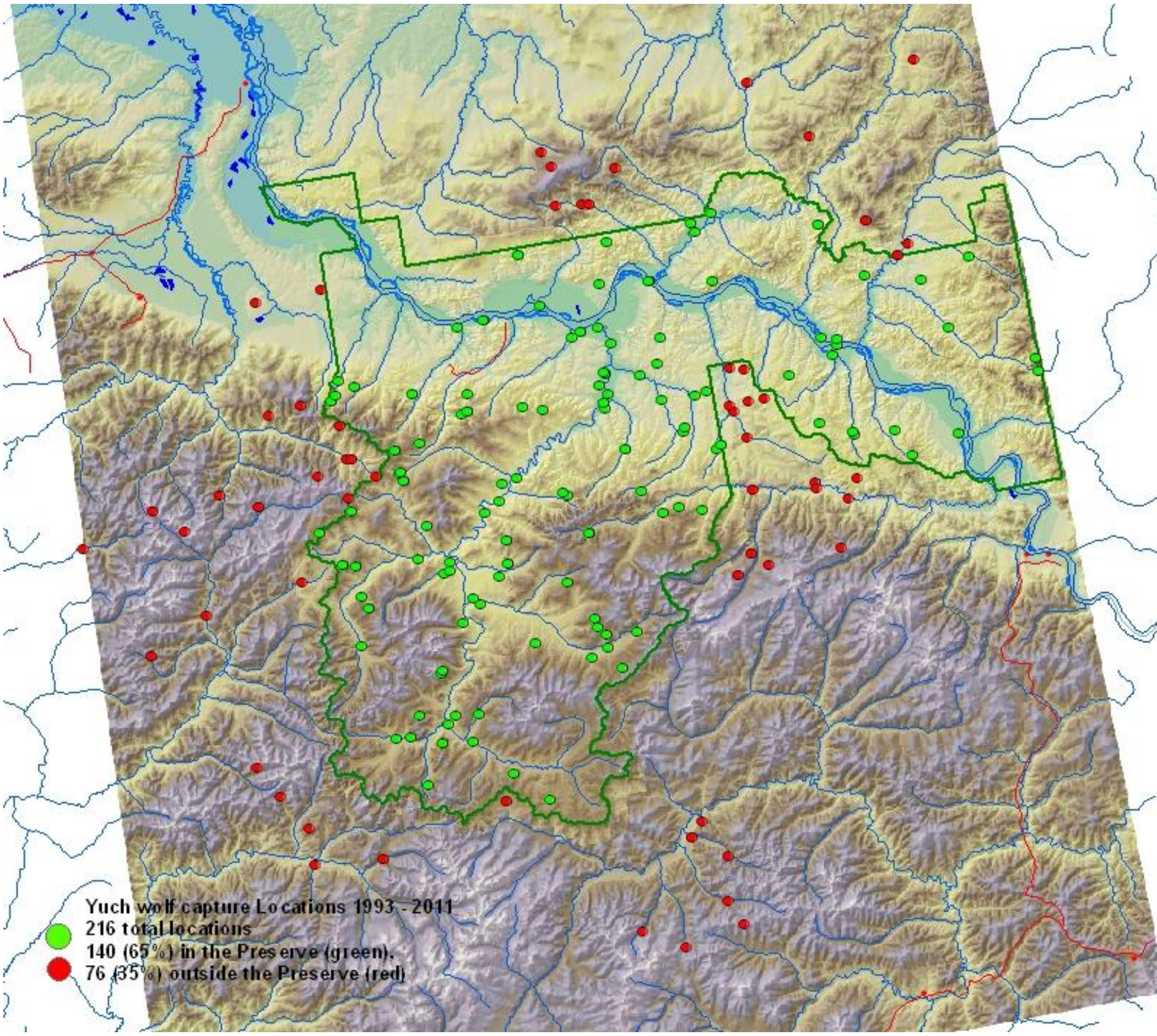

Figure 2. All wolf capture locations from 1993 – 2010. 216 total locations, 140 (65%) within the Preserve boundary, 76 (35%) outside the Preserve.

Home range Size, Movements, Density and Population Estimates

Individual home ranges, pack sizes and density estimates for Fall 2009 – Spring 2011 are shown in Figures 3 – 6. We know that packs of wolves exist in the areas of the preserve north of the Yukon River, but we were unable to find them to capture and collar any of them. This past winter (2010 - 2011) all 9 packs stayed home and none went on any type of foray (long-distance movement outside of their territory documented via the GPS collars), which is unusual. This likely occurred as a result of an unusually large portion of the Fortymile Caribou Herd (FCH) wintering in the Charley River. Forays in past years appeared to be packs of wolves following or looking for concentrations of caribou. During most winters, the FCH leave the Charley River valley (Valkenburg et al 1994) and the wolves that live there become dependent on a small number of remaining caribou and a low density moose population (Burch 2010) and likely become food stressed.

From 1993 - 2002, before the common use of GPS collars, home range sizes for individual Preserve packs averaged 2300 km^2 (888 mi^2) and varied from 268 – 7067 km^2. Annual mean home range size ranged from 1639 to 3253 km^2 (633 – 1256 mi^2) (Burch 2002). With the advent of GPS collars, the annual number of locations per pack has increased nearly 10 fold and with it came an increase in individual home range size (Burch et al. 2005). Home range sizes of packs containing one GPS collar were more than 35% larger than those found using conventional aerial telemetry (Figure 7).

In years prior to the common use of GPS collars, home range size was measured for each radiomarked pack where more than 20 locations were available in a 2 year time block. This was an attempt to overcome the problem of home range size being dependent on the sample size of locations (when calculated using Minimum Convex Polygons (MCP)). Even with this doubling of sample size the relationship still holds ($r^2 = 19.4$, $P = 0.00017$, n = 67) (Figure 8) and MPC home range size was still dependent on the number of locations (White and Garrott 1990). With the advent of GPS collars, 1 biological year of locations is used, but the problem of home range size being dependent on sample size appears to still exist even with 300 locations per year, although the effect is much smaller.

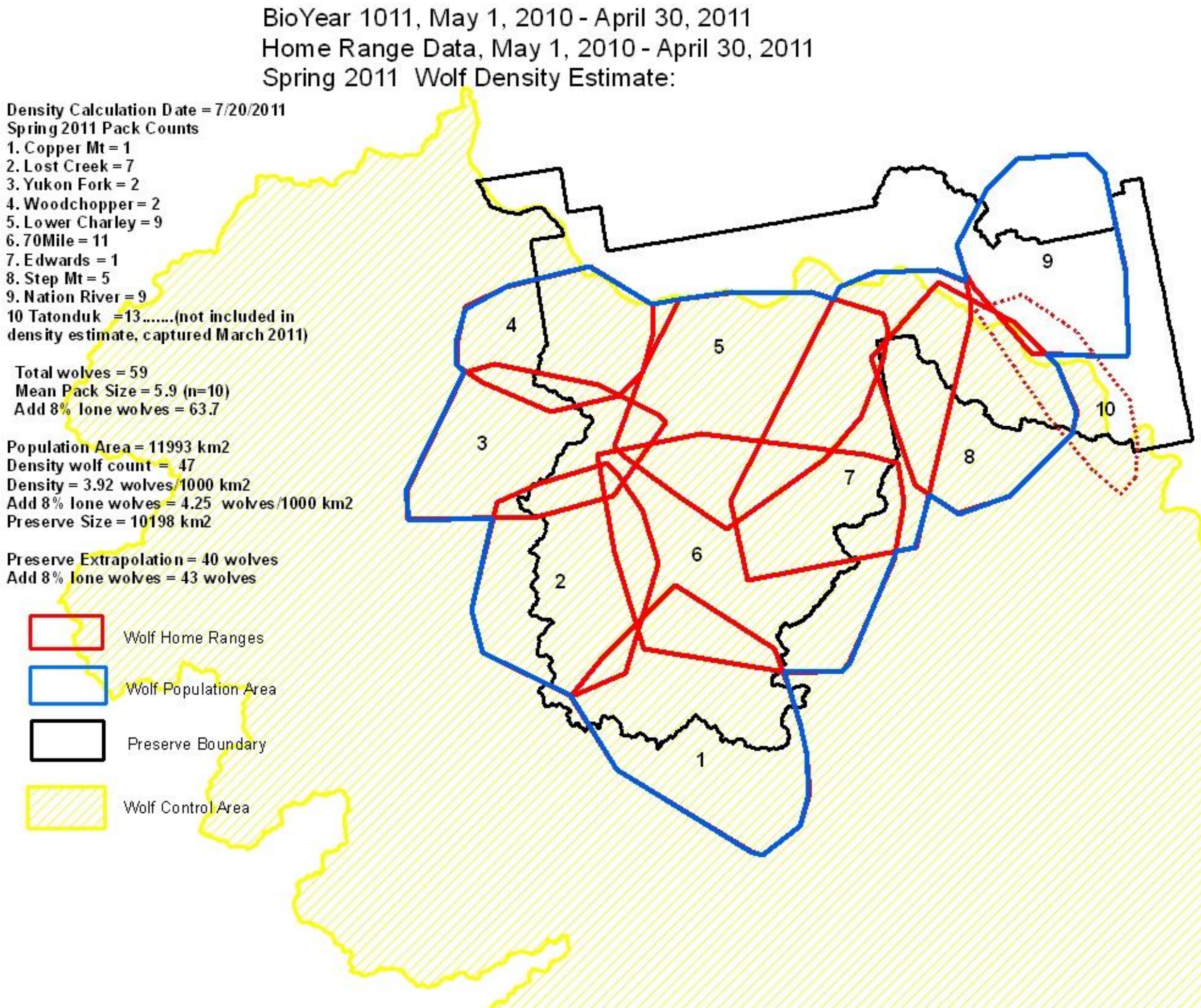

Figure 3. Spring 2011 map of individual pack home ranges, pack counts, and density calculation. Minimum convex polygons are used to delineate pack home ranges.

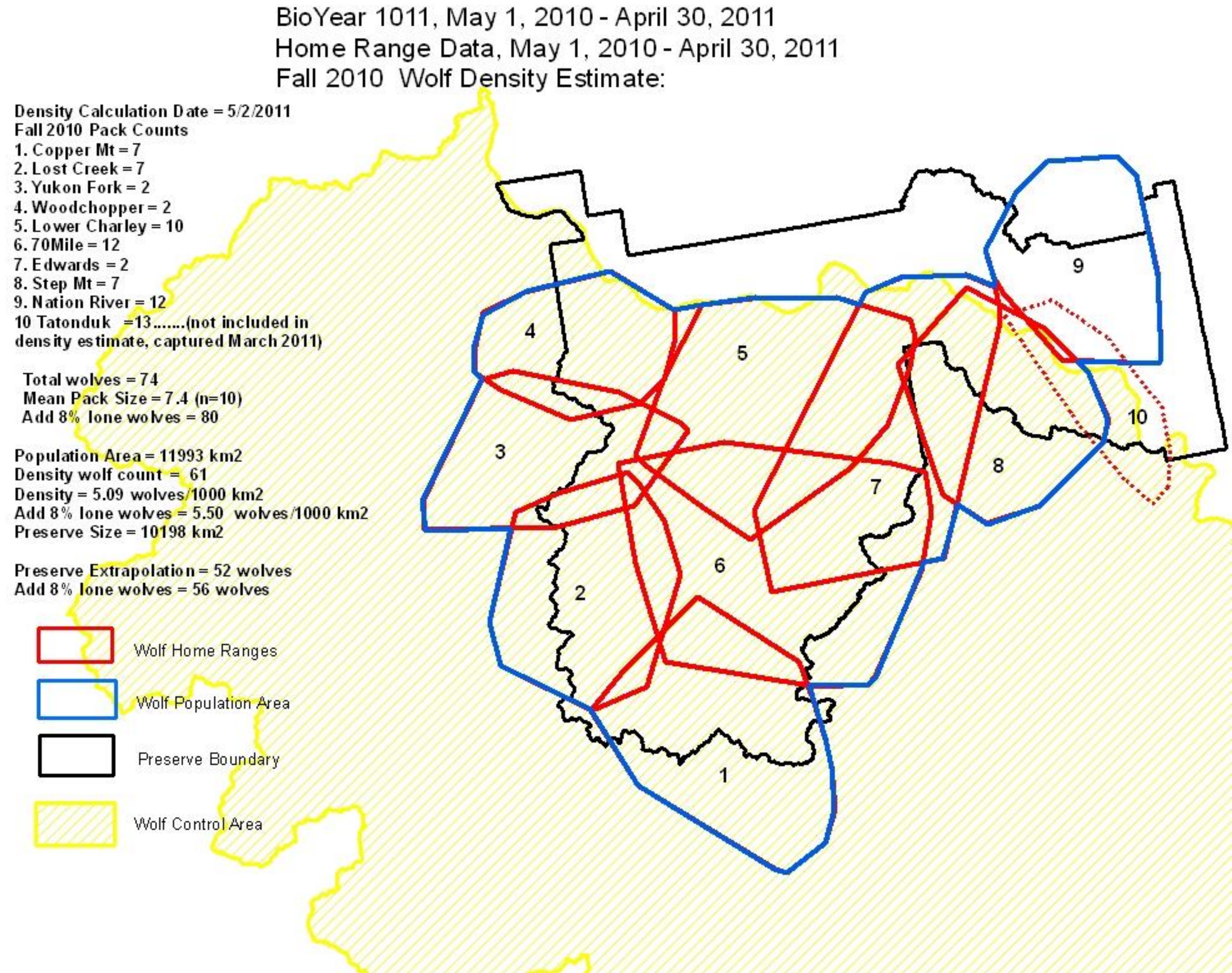

Figure 4. Fall 2010 map of individual pack home ranges, pack counts, and density calculation. Minimum convex polygons are used to delineate pack home ranges.

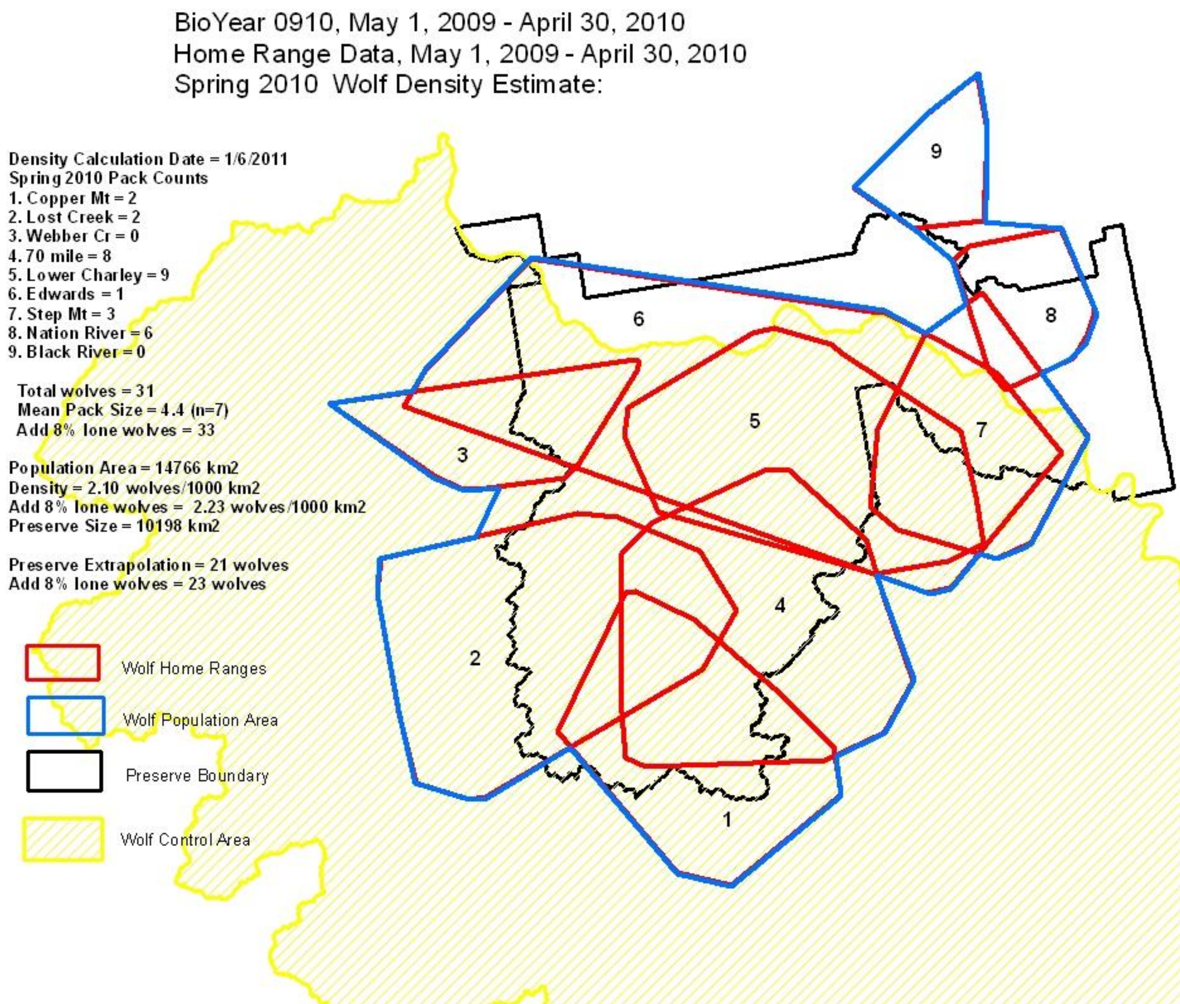

Figure 5. Spring 2010 map of individual pack home ranges, pack counts, and density calculation. Minimum convex polygons are used to delineate pack home ranges.

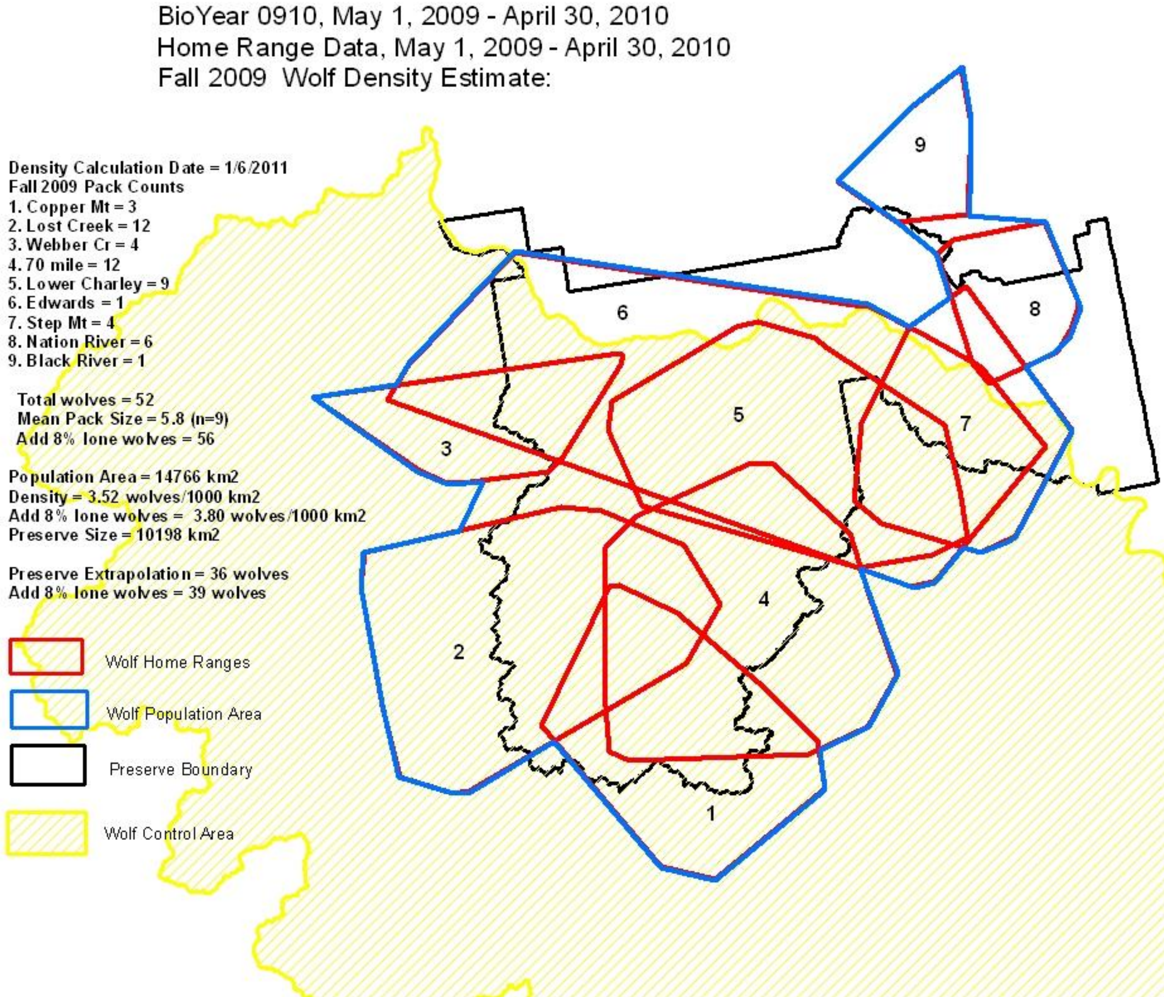

Figure 6. Fall 2009 map of individual pack home ranges, pack counts, and density calculation. Minimum convex polygons are used to delineate pack home ranges.

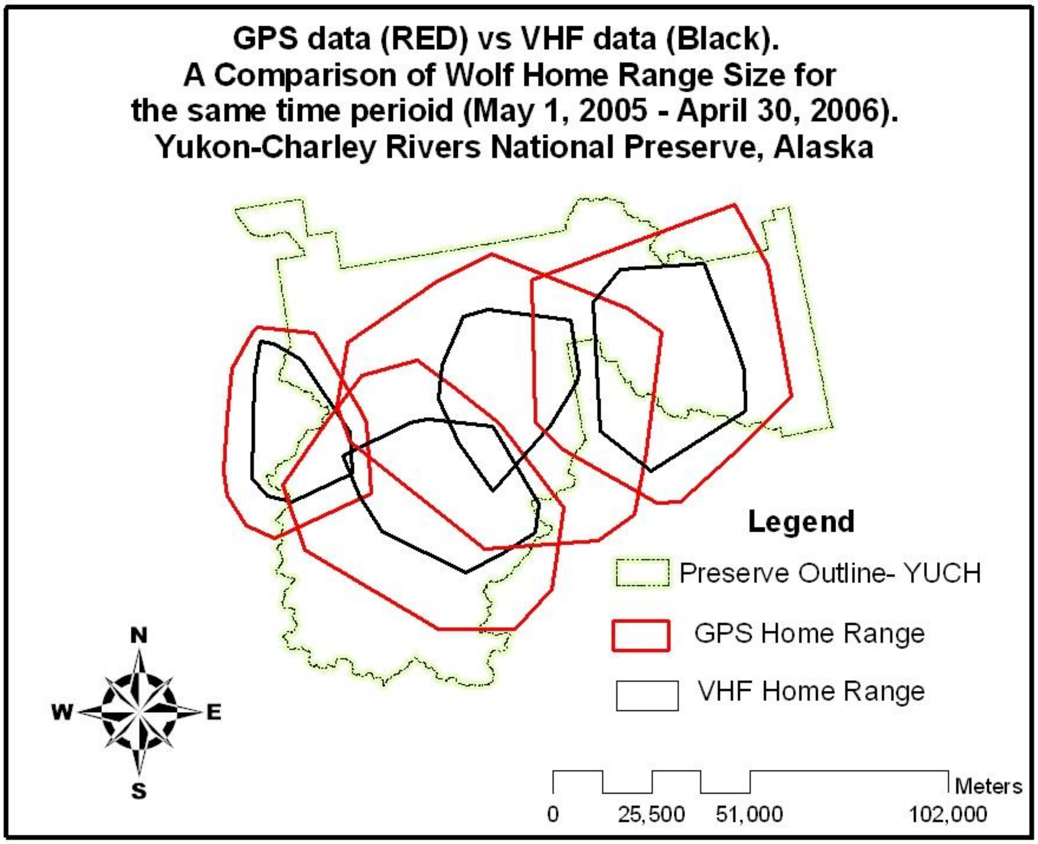

Figure 7. Wolf home ranges measured with GPS collars are over 35% larger on average than those from conventional aerial radiotelemetry (VHF) when measured over the same time period. Average GPS home range = 3322 km^2. Average VHF home Range = 1211 km^2. Not all home ranges depicted for clarity.

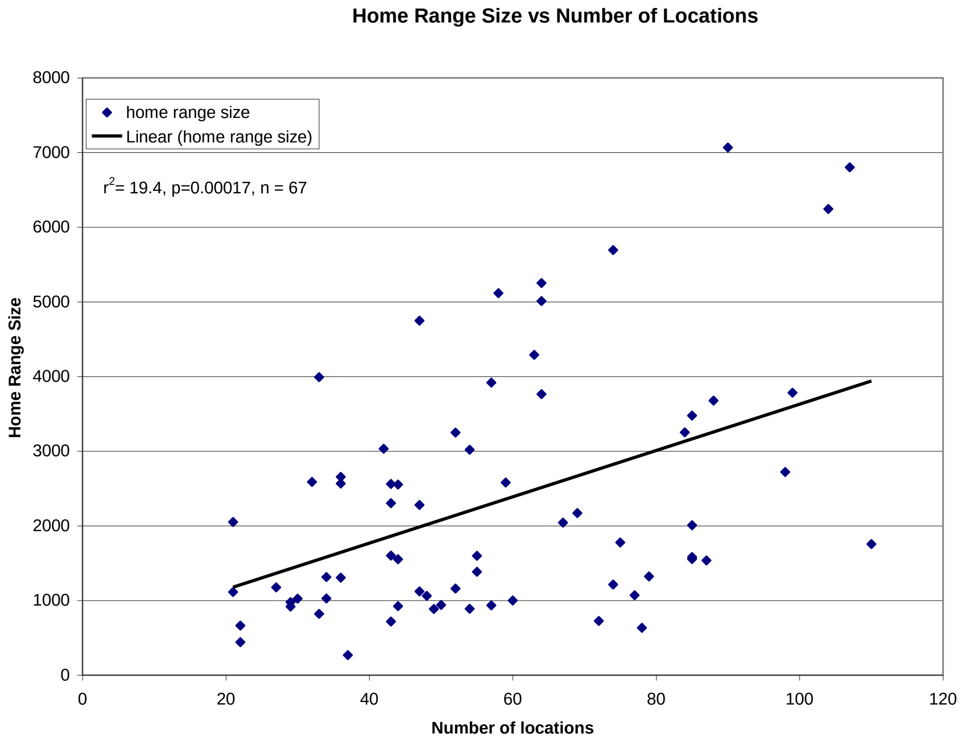

Figure 8. Wolf home range size vs. number of locations showing that home ranges calculated using minimum convex polygons are dependent on sample size of locations. Yukon-Charley Rivers National Preserve, Alaska, 1993 – 2005.

Kernel Home Range Analysis

This was the second year in which kernel analysis (Worton, 1989) was used to measure the population area in addition to minimum convex polygons (MCPs) (Figure 9). We hope to develop a more objective and consistent method for measuring annual home ranges and population area size to be used in calculating wolf density estimates. One problem with MCPs is their dependence on sample size of locations (White and Garrot 1990, Burch et al 2005), a second problem is the subjective decisions needed to remove outliers where wolves disperse or temporarily leave their home range on forays. Using the 75% Kernel for Spring 2011 produces a population area of 10671 km^2 and a density of 4.4 wolves/1000km^2 a higher density than that obtained using the standard minimum convex polygon (MCP) method, 3.92 wolves/1000km^2 (Figure 9 vs. Figure 3). The decision to use the 75% kernel was also subjective and was chosen last year as the kernel percentage producing a population area nearest to the one derived from the MCPs. As a result, we may simply be replacing one subjective decision with another.

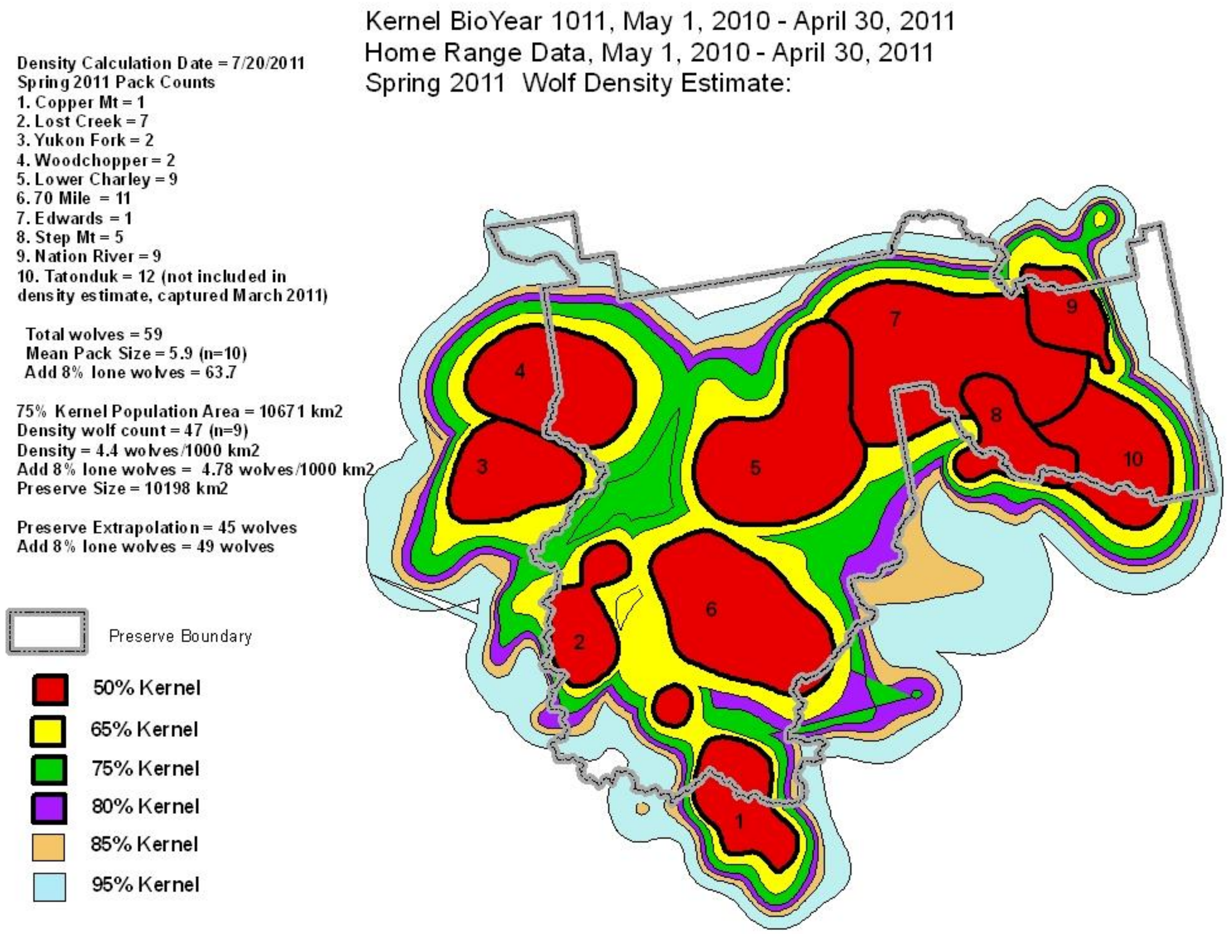

Figure 9. 65% - 95% Kernel home ranges of the Spring 2011 population areas (formed by dissolving the overlap of the kernels for the individual packs for each percentage). 50% kernels are for each individual pack homerange. The Density calculation is made from the 75% population area kernel.

Pack Sizes and Population Change

Fall mean pack sizes have ranged from 4.3 to 9.1, with an 18 year average (1993 – 2010) of 7.1 (Figure 10). The wolf population in the area continues to fluctuate and is likely responding to changes in the accessibility and vulnerability to predation of Fortymile Caribou. From 1993 – 2001 the increasing trend in mean pack size was significant (r^2=0.59, P=0.015), however from 2002 on it levels out and then drops in 2005 (Figure 10). Wolf densities follow the same trends as mean pack sizes (Figures 12 & 13). Most recently, the population hit an all-time low density of 1.6 wolves/1000 km^2 in spring 2007, then rebounded to almost 2.5 in spring 2008. The fall 2008 wolf density estimate was the highest calculated since the study began in 1993 at 5.86 wolves/1000 km^2. This was followed by the largest drop in population size to a spring 2009 density of 2.41 wolves/1000 km^2. This large drop (61% when measured by mean pack size,

Table 1, Figure 11) seems to be related to the State of Alaska wolf control efforts, however this is not reflected in the fates of the sample of radio collared wolves, or by what could be learned from word of mouth. The Fall 2010 density of 5.09 was above the 18 year average of 4.23, and the Spring 2011 density of 3.92 was tied with 2004 for the highest spring density ever measured for the project, and well above the 19 year average of 2.81 (Burch 2002, 2006, 2007, 2008, 2009). This was likely due to a large portion of the Fortymile Caribou Herd remaining in the Charley River for the winter. Fall densities are measured when pack sizes are at their highest and densities are greatest for the biological year and follow the same overall trend pattern as mean pack size (Figure 10). Pack sizes are actually greater right after pups are born in May. However, we cannot reliably count all the pups from airplanes in all the packs until September or October when the pups are traveling consistently with the rest of the pack and there might be some snow on the ground to increase sightability.

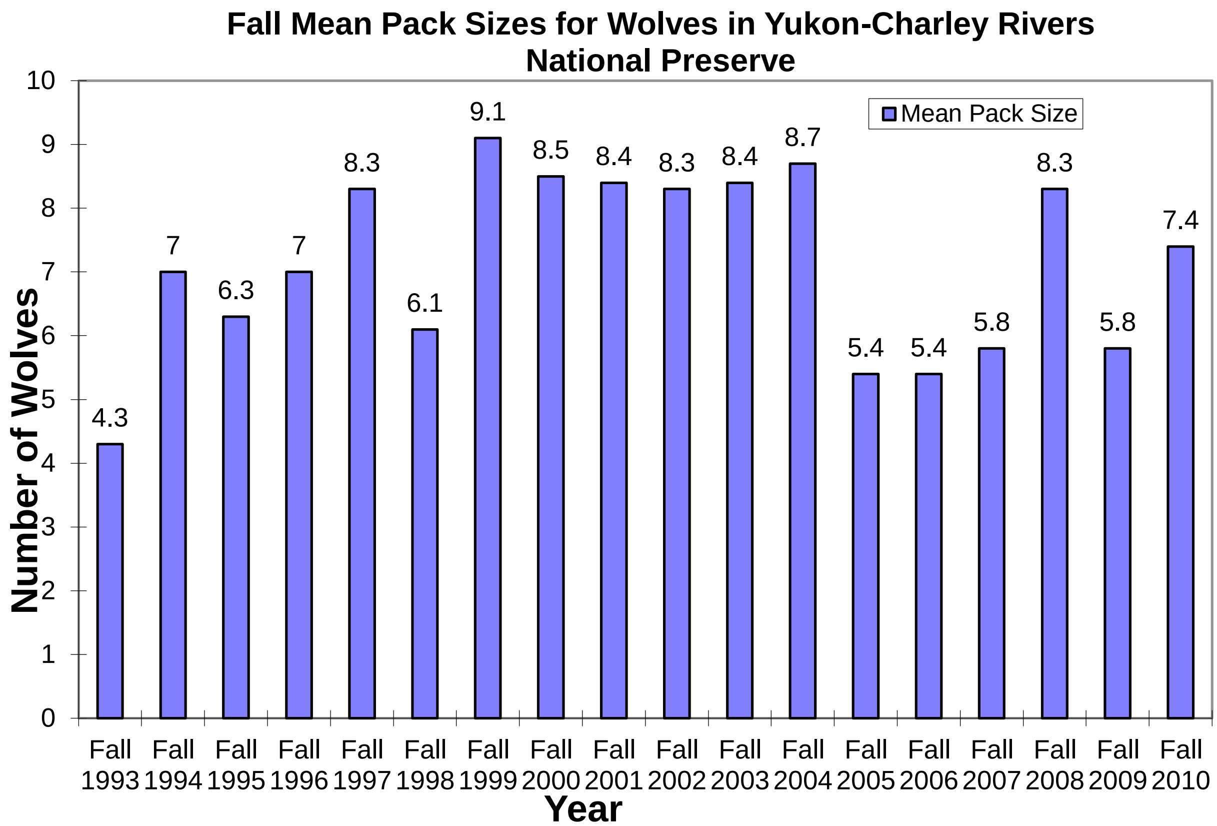

Figure 10. Trend in wolf population using Fall mean pack size, 18 year Average = 7.1. Yukon-Charley Rivers National Preserve 1993 – 2010.

A new measure of wolf population change was developed in 2010 to help make management decisions quickly at any time through the year. Accurate density estimates require a full biological year (May 1 – April 30) of location/home range data to calculate the area used to make density estimates consistently from one year to the next. As a result, density estimates calculated earlier in the year must be based on the previous year's location data and what location data is available so far from the current year. Shifts in pack home ranges over time can result in erroneous or inaccurate density estimates. The chosen metric of wolf population change utilizes the drop in counts (or mean pack size) of radio-marked packs from fall (September/October) to Spring (March and April) or at any time in between. During biological year 2009-2010, the counts dropped from 52 to 31 wolves, a decline of 40%, the largest drop seen in 14 years of data not thought to be influenced by wolf control (Table 1). For this year (2010–2011) the counts dropped from 74 wolves to 58 wolves or a drop of 22% (Table 2) which is well within the normal range of 11%-37% (Tables 1 & 2, Figure 11). This measurement is essentially identical to the drop in wolf densities from fall to spring as reported previously in Burch (2002, page 44) but because it uses mean pack size instead of density it can be calculated quickly at any point in the biological year.

These data were some of the inputs in a Structured Decision-Making (SDM) model (SDM fact sheet, U.S. Fish & Wildlife Service, October 2008) used by YUCH Superintendent Greg Dudgeon to decide to temporarily close the sport hunting and trapping seasons in YUCH in spring 2010, while keeping the subsistence harvest of wolves open. The decision was based on the fact that, although the spring 2010 wolf density looked as though it was going to be close to past spring densities (Figure 13), the actual count of total number of wolves in collared packs dropped 40%, from 52 wolves in the fall to 31 wolves by February, and the added threat of more wolves with home ranges in the Preserve being killed in the State's wolf control program outside the Yukon-Charley boundary through the end of April.

Table 1. History of changes in mean pack size for collared packs between fall and spring. This only includes packs where data are available for both seasons. The 3 years highlighted in red indicate years where predator control activities likely, (or were known) to have affected population changes and are not included the 'normal' range (green).

Winter	Fall	Spring	Percent Drop
1993 - 1994	4.5	4	11%
1994 - 1995	7	5	29%
1995 - 1996	7.3	6	18%
1996 - 1997	10.3	7.7	25%
1997 - 1998	8	5.6	30%
1998 - 1999	6.7	5.7	15%
1999 - 2000	8.2	5.5	33%
2000 - 2001	7.9	5.3	33%
2001 - 2002	8.8	6.5	26%
2002 - 2003	8.6	7.1	17%
2003 - 2004	9.2	6.7	27%
2004 - 2005	8.7	5.5	37%
2005 - 2006	7.4	5.2	30%
2006 - 2007	4.9	2.4	51%
2007 - 2008	5.8	4	31%
2008 - 2009	7.4	2.9	61%
2009 - 2010	5.8	3.4	41%
2010 - 2011	7.4	5.8	22%
Range (Normal)	4.5 - 10.3	3.7 - 7.7	**0.11 - 0.37**
Average (15 years)	7.7	5.7	26%

red rows = years likely or known to be effected by wolf control

Table 2. Change in pack counts and the percent drop in size of radio collared wolf packs in Yukon-Charley Rivers National Preserve from Fall 2010 to Spring 2011.

	Pack	Fall 2010	Spring 2011	Percent Drop
1	Copper Mt	7	1	86%
2	Lost Creek	7	7	0%
3	Yukon Fork	2	2	0%
4	Woodchopper	2	2	0%
5	Lower Charley	10	9	10%
6	70Mile	12	11	8%
7	Edwards	2	0	100%
8	Step Mt	7	5	29%
9	Nation River	12	9	25%
10	Tatonduk	13	12	8%
	Total wolves	74	58	22%
	Average	7.4	5.8	22%

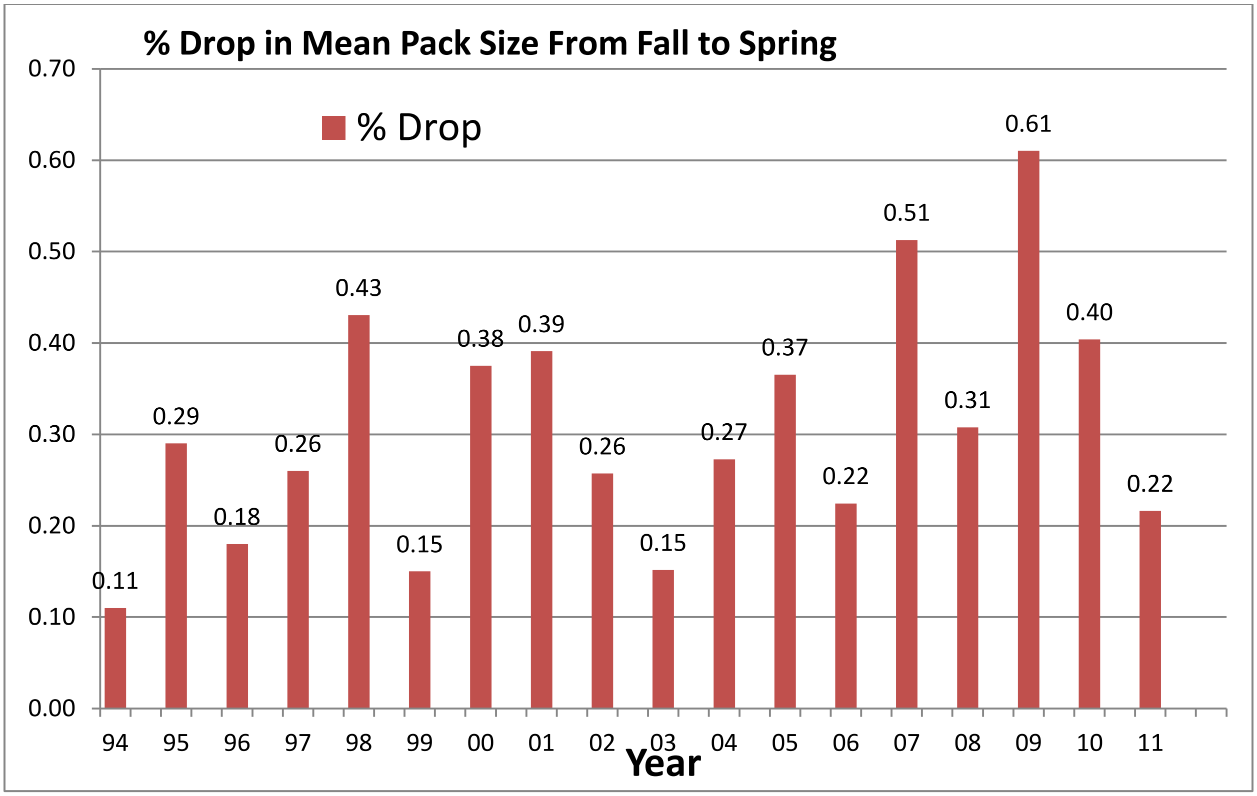

Figure 11. Drop in mean pack size (percent drop from Fall to Spring) from 1994 - 2011. The 18 year average = 0.31. Yukon-Charley Rivers National Preserve, Alaska.

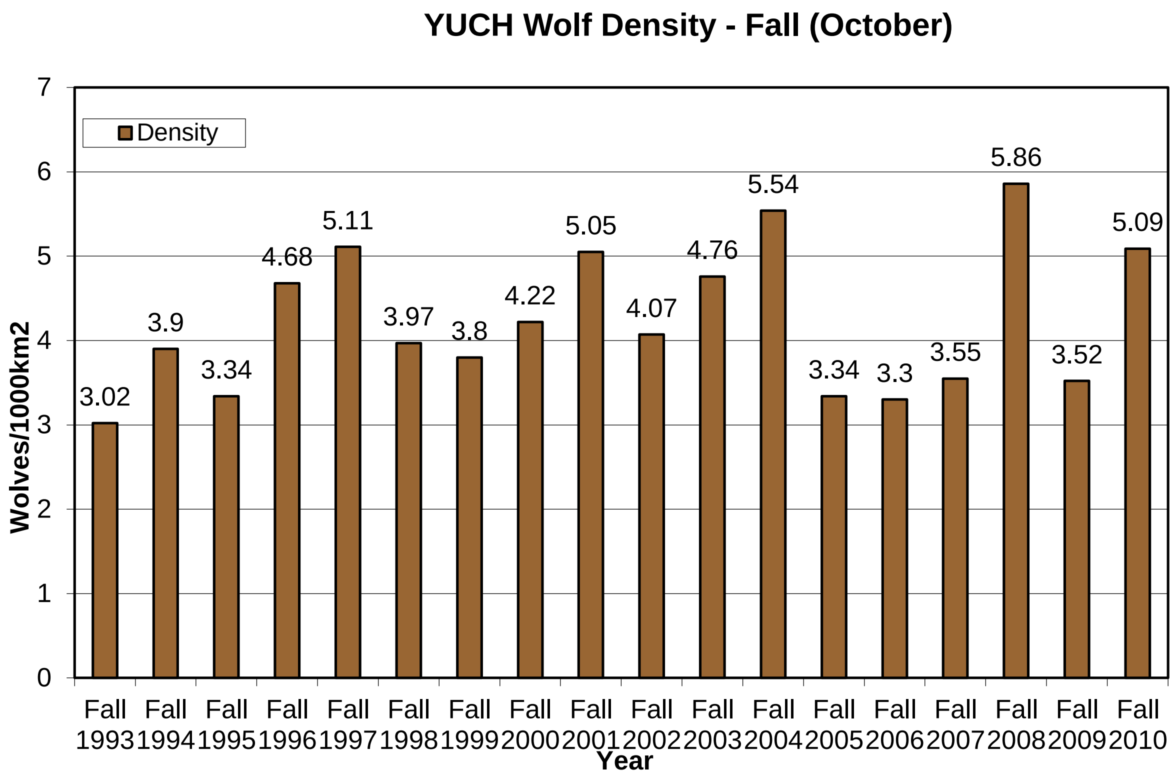

Figure 12. Fall wolf densities (wolves/1000 km^2) in YUCH 1993 – 2010. (Average=4.23).

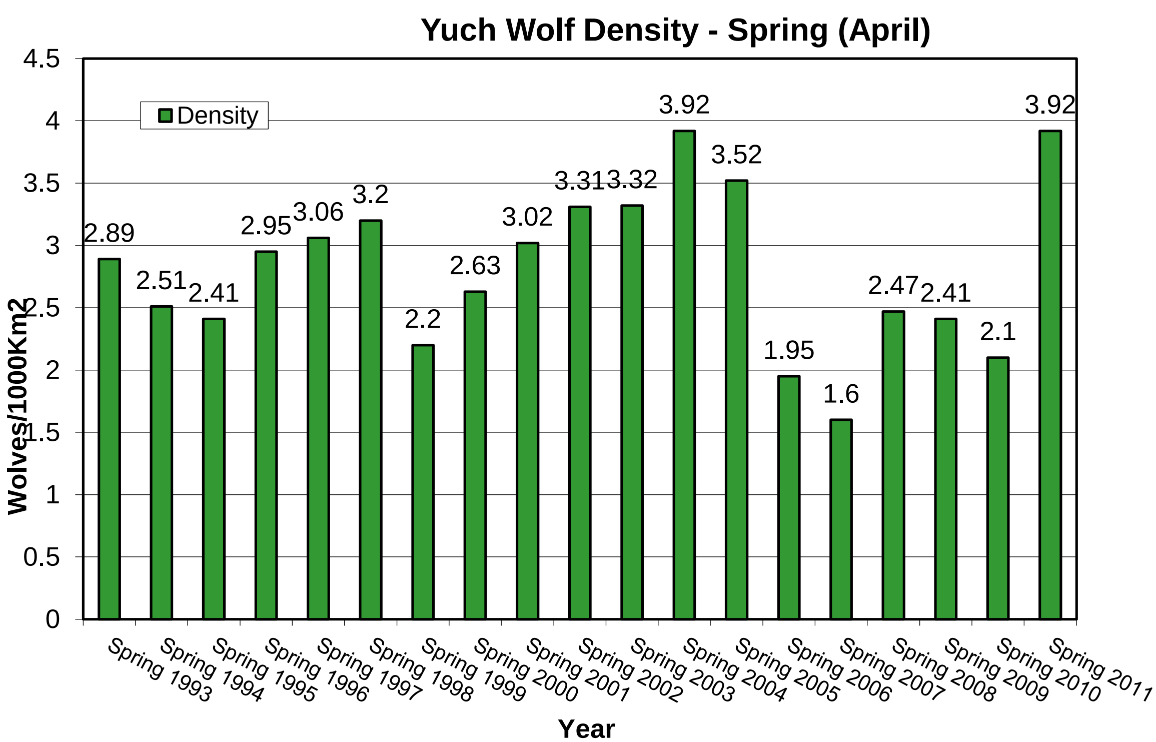

Figure 13. Spring wolf densities (wolves/1000km^2) in YUCH, 1993 – 2010 (Average= 2.81).

Fortymile Caribou

In 1920 biologist Olaus Murie estimated the Forty Mile Caribou Herd (FCH) to number 568,000 caribou, and the herd ranged from Whitehorse, Yukon to the White Mountains north of Fairbanks (Murie 1935). It is difficult to know how accurate Murie's estimate was as he estimated how many caribou crossed a 1 mile stretch of the Steese Highway in one day and then multiplied that number for a 40 mile stretch of highway for 20 days, which is what was reported by others to be the extent and duration of the herd's crossing the road (Murie 1935). In the 1930s the herd population dropped to an estimated 10,000 to 20,000 caribou (Valkenburg et al 1994). The cause of this dramatic decline is unknown but suspicions include overharvest, food limitations due to range depletion and fires, or other wide spread phenomena. Predation was not considered a causal factor (Valkenburg et al 1994).

During the 1940s and 1950s the herd increased again to perhaps as many as 50,000. From an estimated 50,000 animals in 1963 the herd size dropped dramatically again to 6000 animals in 1973 and Fortymile caribou stopped crossing the Steese Highway. The cause of this decline was attributed to a combination of overharvest, deep snow conditions, and predation by wolves and bears (Valkenburg et al 1994). Starting in 1976, the herd began to increase slowly, to over 22,000 by 1990, and was roughly stable at 22000 – 23000 through 1995 (Valkenburg et al 1994, Boertje and Gardner 1996). In 1994 the Fortymile Planning Team was formed and plans for wolf reductions and reduced human harvest of Fortymile caribou were made. From 1995 through 2002, the herd grew to nearly 45,000 animals (Boertje and Gardner 1996, Jeff Gross, Tok area biologist, Pers. Comm.) after which it declined to just over 38,000 in 2007. The population then increased again over the next 3 years. The most recent photo census in June 2010 produced a population estimate of at least 51,000 (a more precise number from the successful 2010 photo census is still pending), (Jeff Gross, ADF&G Tok area biologist, Pers. Comm.) (Figure 14).

The drop in wolf numbers in 2005 – 2007 does not correlate well with the change in caribou numbers during the same time (Figure 14). Low snowfall winters at this time may have allowed the caribou (and moose) to be less vulnerable to wolf predation, thereby causing an increase in wolf dispersal and natural mortality and a decrease in pup production and survival (Figure 15), culminating in a drop in the wolf population for those years. Human harvest levels at this time were lower than the 23 year annual average of about 7 wolves harvested within the Preserve (Figures 16 &18) and likely played no role in this drop in wolf numbers.

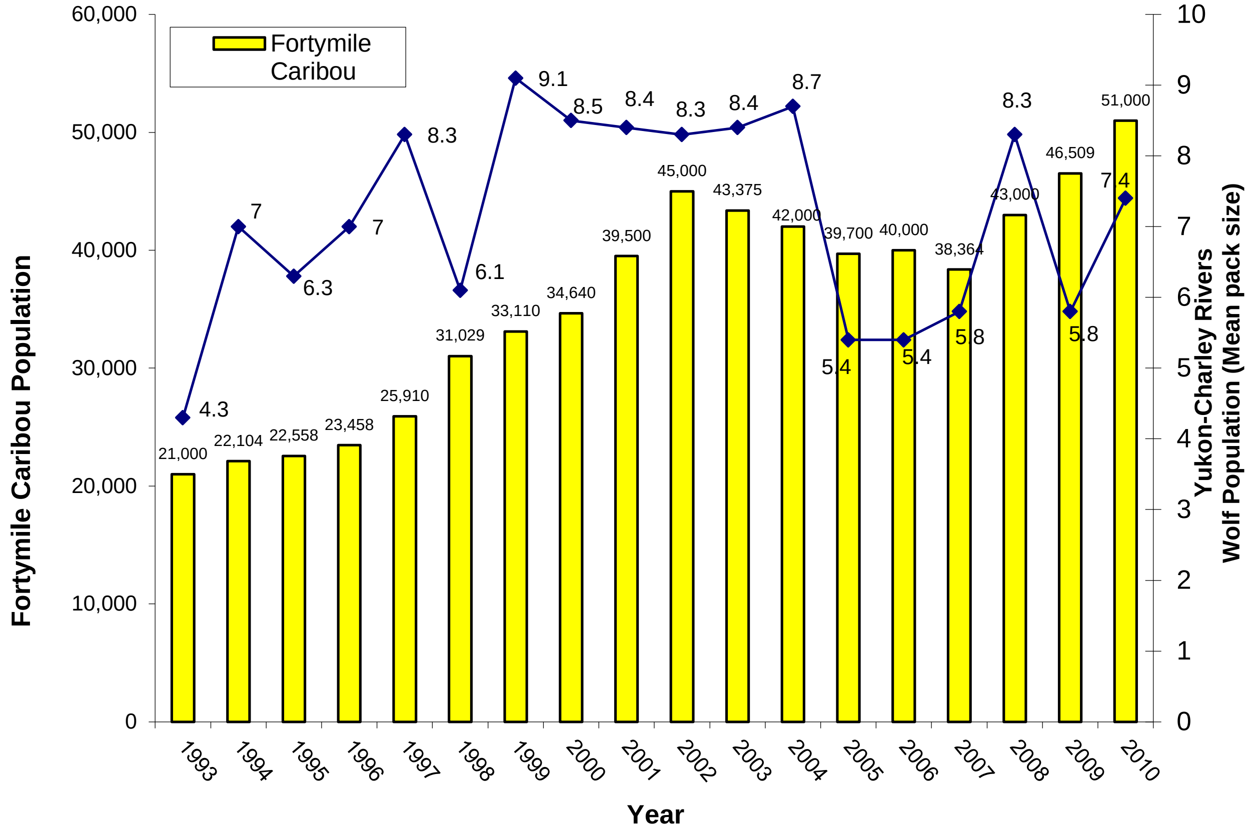

Figure 14. Trend in population change for the Fortymile Caribou Herd (trend in ADF&G's photo census counts) and wolves (Fall mean pack size) in Yukon-Charley Rivers National Preserve, Alaska, 1993 – 2010.

Natality

Pup production and survival to fall is illustrated in Figure 15. The counts of pups are from September - November of each year when the pups are still small enough to distinguish from adults from an airplane. At that time, leaf fall, snow, and the wolves (including the pups) beginning to travel more widely as a pack make conditions more favorable for seeing and counting wolves from aircraft. Likely there are more pups born in May than are seen in the fall, and some pup mortality occurs between May and September, so these are minimum counts. The cause of the drop in pup production and/or survival in 2004 and 2005 is unknown but correlates well with the overall drop in population size from 2004 to 2006 (Figures 10 - 13).

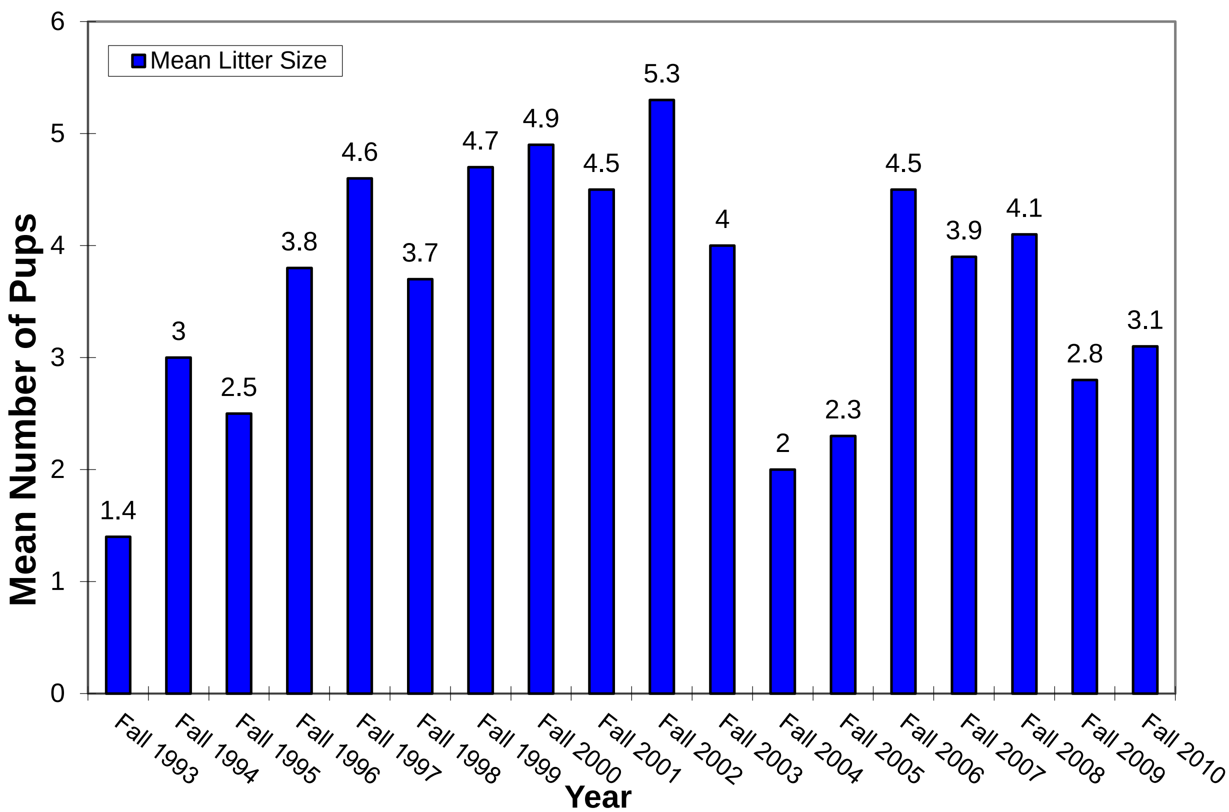

Figure 15 – Trend in Pup production and survival to fall (September/October mean litter sizes), 18 year average = 3.6.

Mortality

Fates of collared wolves

Fates of a sample of 139 radiocollared wolves (from the beginning of the project in 1993) is illustrated in Figure 16. Although the sample of collared wolves is not representative of the population, they probably give a good idea of what happens to most wolves in the Yuch population. About 25% of YUCH wolves are trapped or shot within or near the preserve each year, and at least 30% disperse from the population. It is likely that many of the wolves in the "fate unknown" category were also dispersals. It is likely that more than half of the drop in wolf numbers that occurs each year results from dispersals. The number of dispersals that are seen even from a sample of wolves baised against dispersal, combined with likelihood that some of the wolves whose fates are unknown also dispersed, illustrates how important dispersal is to wolf population change (Gese and Mech 1991). Most mortalities of collared wolves have occurred within or close to the Preserve boundary (Figure 17).

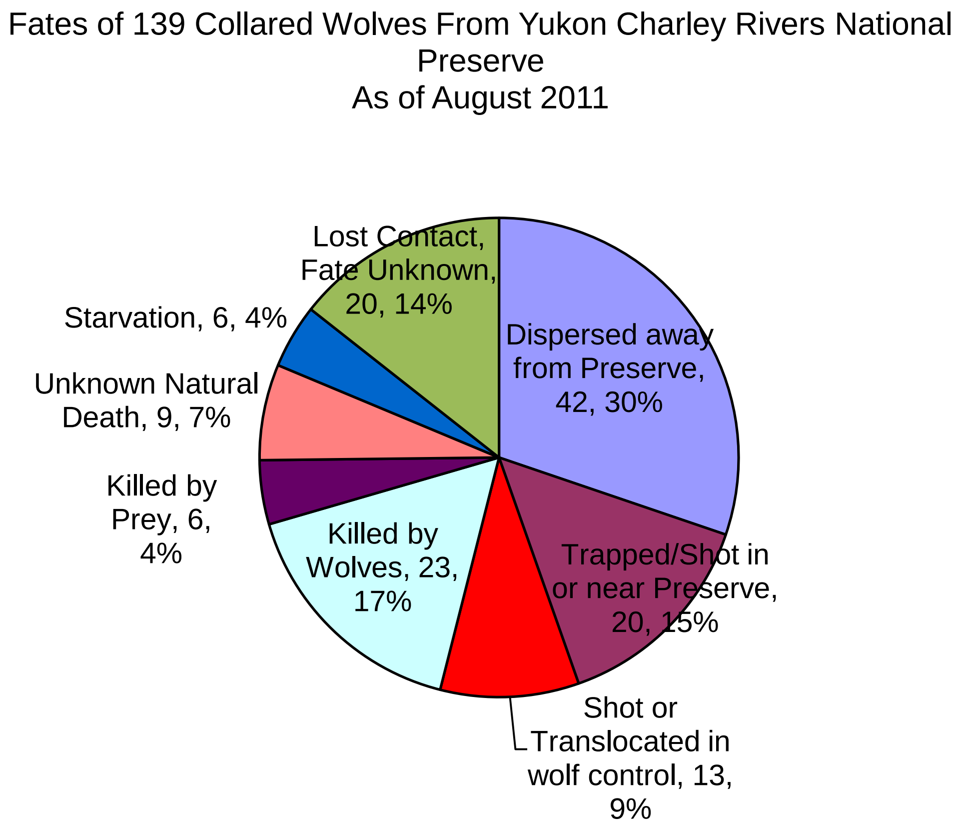

Figure 16. Fates of 139 collared wolves in and around YUCH, 1993 – August 2011.

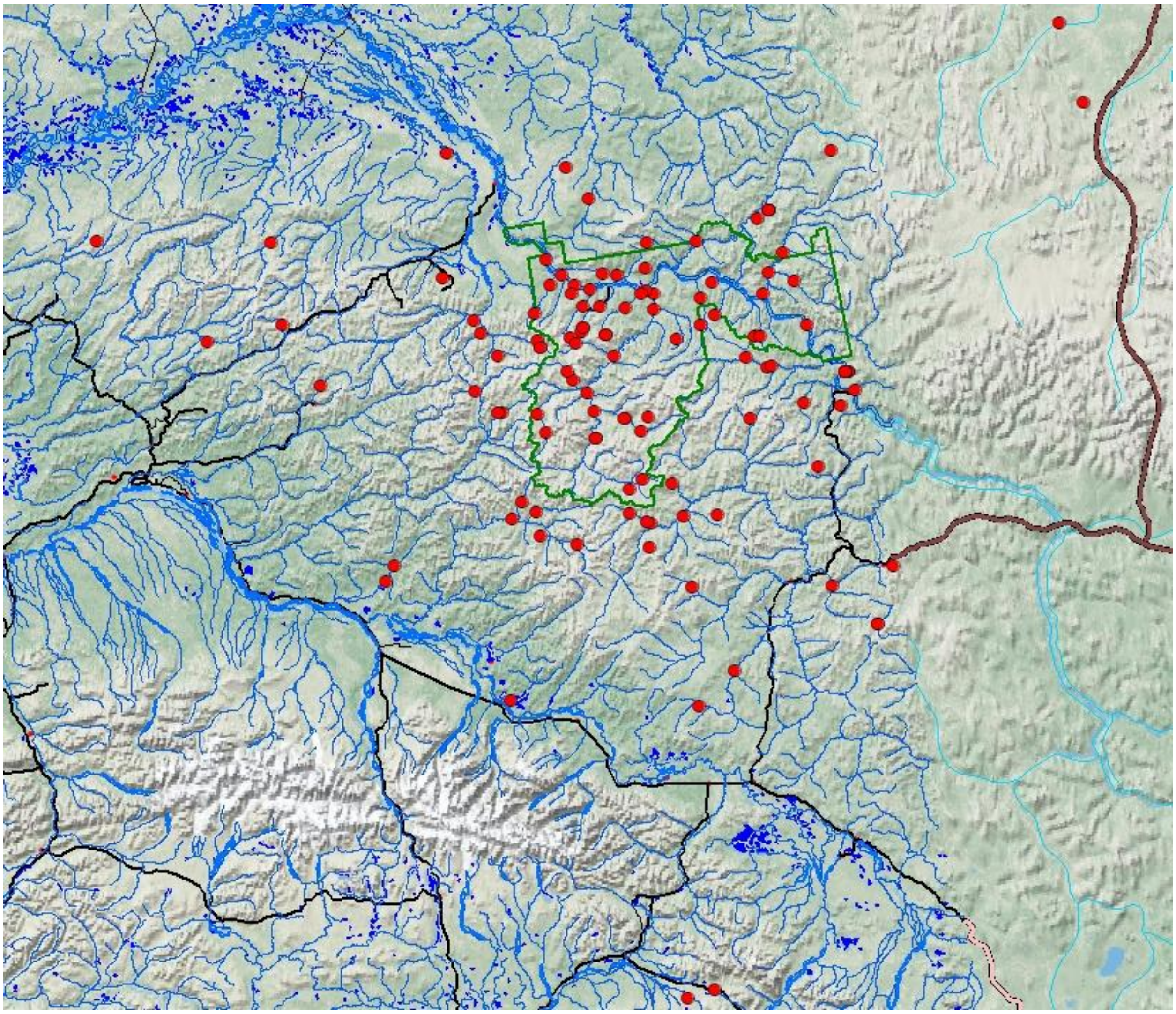

Figure 17. Locations of 124 known wolf mortalities from 1993 – 2011. Most wolf mortalities (102) were from radiocollared wolves. The more distant locations are wolves that dispersed before they died.

Wolf Harvest

The wolf hunting season in YUCH was extended in 2008, and now runs from August 10 – May 31 with a bag limit of 5 wolves south of the Yukon River in GMU 20, and 10 wolves north of the Yukon in GMU 25. The trapping season runs from Oct 1 (GMU 20) or Nov 1 (GMU 25) to April 30 with no bag limit. Even with these liberal regulations, few wolves are harvested in or near YUCH during most winters. Based on ADF&G sealing records, human harvest of wolves from within the preserve (via conventional trapping and hunting methods) has averaged about 6.7 wolves per year over the past 26 years (Figure 18). This harvest is 14% of the YUCH fall wolf population over an 18 year average of 46.61 wolves each fall including an added 8% for lone wolves. This level of harvest probably has had little impact on wolf population change in YUCH, and is probably mostly compensatory, removing wolves that would have died anyway.

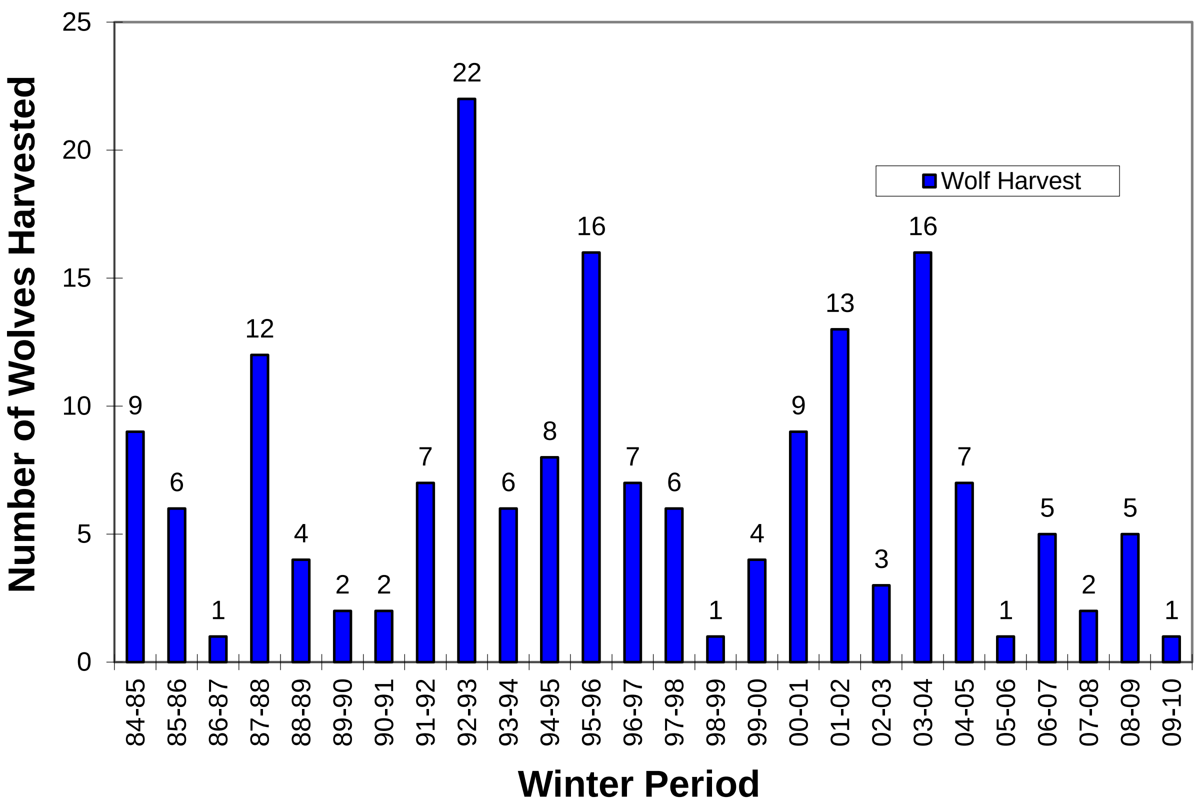

Figure 18. Harvest of wolves primarily within YUCH (Total wolves harvested in the Universal Coding Units (UCUs) that comprise Yuch), 1984 - 2010. From ADF&G wolf sealing records. 26 year average = 6.73.

ADF&G predator control in the UYTPCA

All preserve packs travel outside the boundaries of YUCH, many extensively (Figure 3 - 6). As a result, regulations regarding wolf management outside YUCH's boundary affect the entire wolf population utilizing preserve lands. In 2004 to 2006, the Alaska Board of Game made a series of decisions (reflected in the State of Alaska statutes that promote sustained yield of a species such as caribou or moose) (Figure 19) to conduct wolf control up against most of YUCH's boundary south of the Yukon River (Figure 3 – 6, 19). However, winters 2006-07 and 2007-08 had poor snow and weather conditions for snow tracking wolves, resulting in very few wolves being killed in the Fortymile Control efforts in those years (58 in 2005-06, 13 in 2006–07, and 27 in 2007-08). Control efforts fell far below the goal of reducing the entire population to somewhere between 88 - 103 wolves.

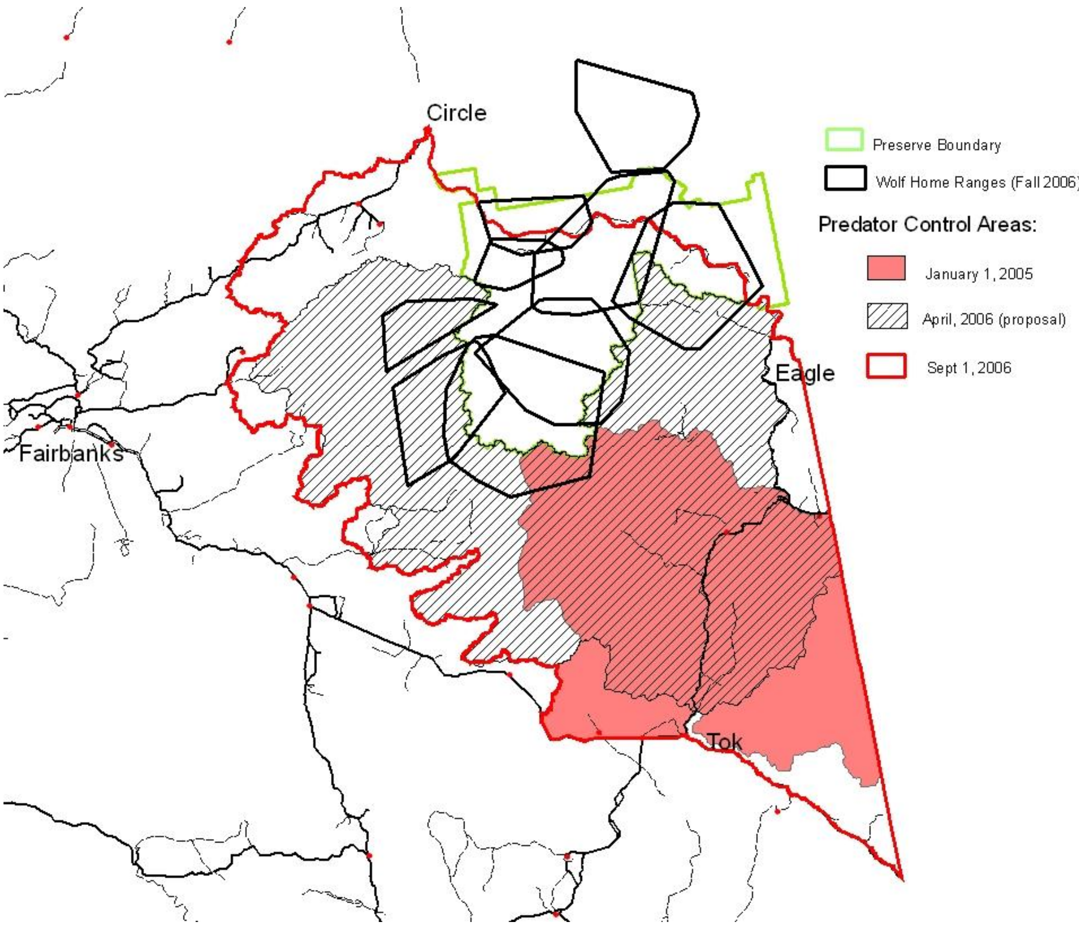

Figure 19. Map depicting the history and progression of wolf control boundaries relative to YUCH. UYTPCA (Upper Yukon Tanana Predator Control Area) = 48,550 km^2 (red line) has been in effect since Sept 2006.

The situation changed in winter 2008-2009, when good snow tracking conditions existed for much of the area, resulting in 49 wolves being shot from permitted fixed-wing airplanes. Furthermore, ADF&G implemented helicopter-based wolf control in March 2009 throughout the Upper Yukon Tanana Predator Control Area (UYTPC), excluding YUCH. A total of 84 wolves were shot from a helicopter in this portion of the control effort. However, none of the killed wolves were documented to have come from radiocollared packs that utilize YUCH lands (Figure 20). Another 87 wolves were harvested by conventional hunting and trapping,, for a total of 220 wolves killed within UYTPCA during the 2008-09 season.

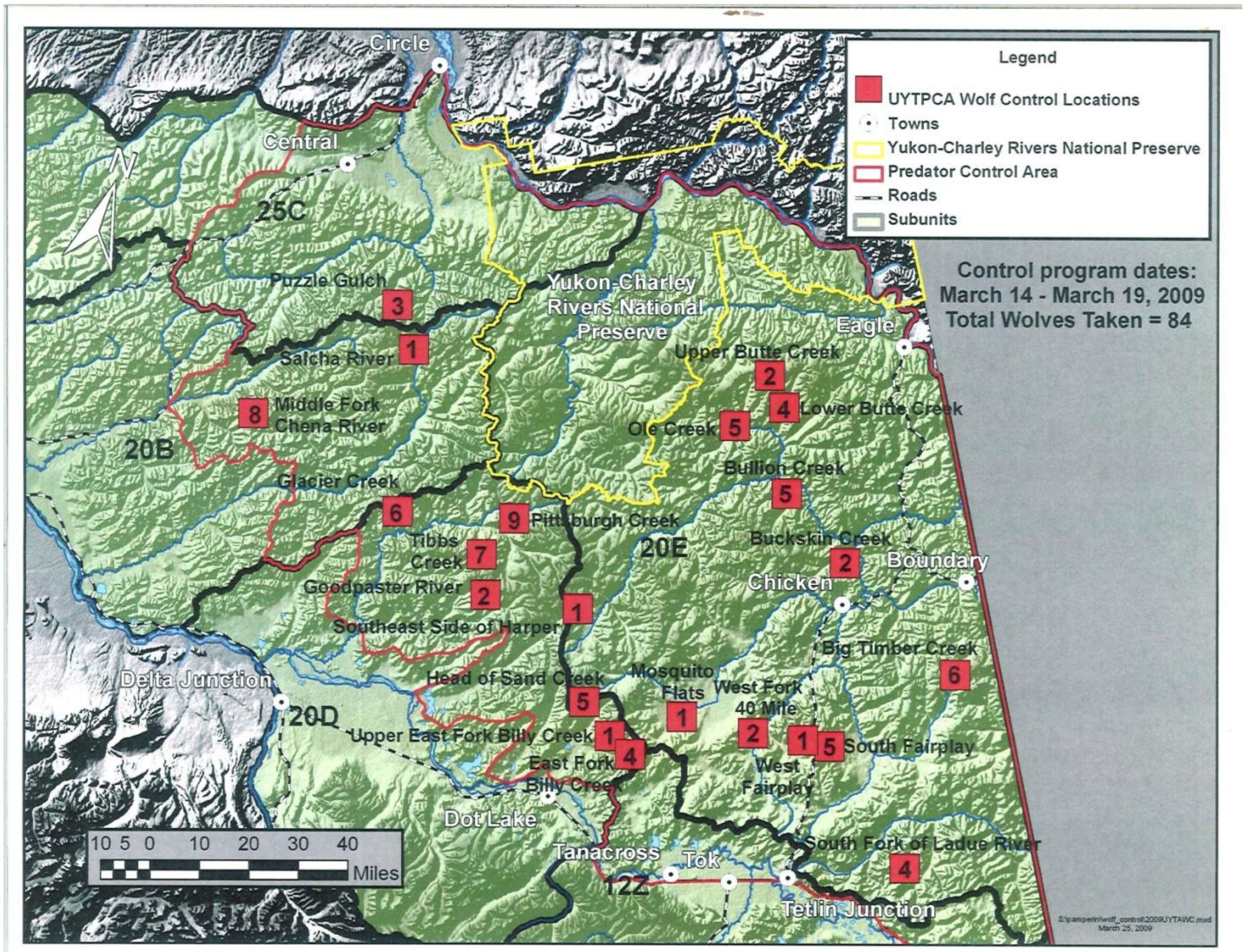

Figure 20. 2009 UYTPCA map of the location and number of wolves killed by ADF&G shooting from a helicopter. No wolves from radio collared packs utilizing YUCH lands were known to have been killed via this method in 2009. Map was created and provided to NPS courtesy of ADF&G, Fairbanks, March 25, 2009.

During winter 2009 – 2010, ten wolves were shot from fixed wing aircraft and 15 were shot from helicopters by ADF&G in the UYTPCA. Conventional hunting and trapping usually take about 65 wolves from the area, so approximately 90 wolves were kill in the control area in winter 2009 - 2010, considerably fewer than the previous years' 220 wolves taken.

On 17 March 2010, during the helicopter control efforts by ADF&G staff, all four wolves of the newly collared Webber Creek pack were shot from a helicopter just outside of the preserve boundary. The two collared and two uncollared wolves shot from the Webber Creek Pack were 4 of the 15 that were shot from helicopters in 2010.

Information on the number of wolves killed in the UYTPCA for winter 2010 – 2011 were not available from ADF&G at the time of this writing. Preliminary information indicated that very few wolves were killed from aircraft during that winter and no helicopter-based control was conducted.

Plans for the coming year

In November 2011 and February 2012, we plan to capture more wolves to maintain 2 or 3 collars in each pack, and to search for and capture wolves from any new or uncollared packs using Preserve lands. During this same time we will also be radiotracking collared wolves from aircraft to get accurate pack counts for fall and spring population estimates. During Spring and Fall of each biological year, collared wolves will be radiotracked 5 – 10 times to generate biannual population estimates and estimate pup production and survival.

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